**FIGURE** 1.1**:** *Trends in Annual Growth Rates in Health and Education Expenditures*

**SOURCE OF DATA:** *Annual Economic Surveys and Statistical Abstracts*

**TABLE 1:** *Summary of Descriptive Statistics*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Aggregate Expenditure on Oil Imports** | **Government Expenditure on Education** | **Government Expenditure on Health** | **Real Oil Prices** | **Exchange Rate** |
| Mean | 63168.59 | 65056.11 | 13665.36 | 29.508 | 40.740 |
| Median | 9356.200 | 13738.96 | 3458.200 | 18.1 | 22.922 |
| Maximum | 335676.7 | 415395.1 | 71851.74 | 108.9 | 103.374 |
| Minimum | 167.160 | 136.200 | 61.080 | 1.21 | 6.961 |
| Std. Dev. | 98414.91 | 100470.9 | 19210.09 | 29.509 | 33.900 |
| Skewness | 1.635 | 1.832 | 1.581 | 1.396994 | 0.354 |
| Kurtosis | 4.361 | 5.514 | 4.444 | 4.05643 | 1.477 |
| Obs. | 55 | 55 | 55 | 55 | 55 |

**SOURCE:** *Computed From Research Data*

**TABLE 2*:*** *Unit root test Results*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Unit Root Tests | **Variables** |  | **ADF test Statistic** | | **PP Test Statistic** | |  |
| **Statistics** | **Critical value** | **Statistics** | **Critical value** |
| **Aggregate Expenditure on Oil Imports** | Intercept | -0.143 | 1%= -3.558  5%= -2.917  10%= -2.596 | 0.095 | 1%= -0.095  5%= -2.917  10%= -2.596 | Not Stationary |
| Intercept and Trend | -1.710 | 1%= -4.137  5%= -3.495  10%= -3.177 | -1.571 | 1%= -4.137  5%= -3.495  10%= -3.177 | Not Stationary |
| **Government Expenditure on Health** | Intercept | 0.748 | 1%= -3.560  5%= -2.918  10%= -2.597 | 0.4132 | 1%= -3.558  5%= -2.917  10%= -2.596 | Not Stationary |
| Intercept and Trend | -1.938 | 1%= -4.137  5%= -3.495  10%= -3.177 | -1.743 | 1%= -4.137  5%= -3.495  10%= -3.177 | Not Stationary |
| **Government Expenditure on Education** | Intercept | 18.404 | 1%= -3.563  5%= -2.919  10%= -2.597 | 14.340 | 1%= -3.558  5%= -2.917  10%= -2.596 | Not Stationary |
| Intercept and Trend | 16.156 | 1%= -4.145  5%= -3.499  10%= -3.179 | 8.655 | 1%= -4.137  5%= -3.495  10%= -3.177 | Not Stationary |
| **Exchange rate** | Intercept | 0.775 | 1%= -3.557  5%= -2.917  10%= -2.596 | 0.711 | 1%= -3.557  5%= -2.917  10%= -2.596 | Not Stationary |
| Intercept and Trend | -2.006 | 1%= -4.137  5%= -3.495  10%= -3.177 | -2.043 | 1%= -4.137  5%= -3.495  10%= -3.177 | Not Stationary |
| **Oil Prices** | Intercept | -1.545 | 1%= -3.560  5%= -2.918  10%= -2.597 | -1.481 | 1%= -3.557  5%= -2.917  10%= -2.596 | Not Stationary |
| Intercept and Trend | -2.462 | 1%= -4.141  5%= -3.497  10%= -3.178 | -2.289 | 1%= -4.137  5%= -3.495  10%= -3.177 | Not Stationary |
| Unit Root Tests at First Difference | **Aggregate expenditure on oil imports** | Intercept | -2.477 | 1%= -3.565  5%= -2.920  10%= -2.598 | -7.102 | 1%= -3.560  5%= -2.918  10%= -2.597 | Stationary |
| Intercept and Trend | -2.381 | 1%= -4.149  5%= -3.501  10%= -3.180 | -7.232 | 1%= -4.141  5%= -3.497  10%= -3.178 | Stationary |
| **Government Expenditure on Health** | Intercept | -9.559 | 1%= -3.560  5%= -2.918  10%= -2.597 | -9.492 | 1%= -3.560  5%= -2.918  10%= -2.597 | Stationary |
| Intercept and Trend | -5.512 | 1%= -4.149  5%= -3.501  10%= -3.180 | -9.868 | 1%= -4.141  5%= -3.497  10%= -3.178 | Stationary |
| **Government Expenditure on Education** | Intercept | 2.456 | 1%= -3.565  5%= -2.920  10%= -2.598 | 0.153 | 1%= -3.560  5%= -2.918  10%= -2.597 | Not Stationary |
| Intercept and Trend | 0.259 | 1%= -4.149  5%= -3.501  10%= -3.180 | -2.939 | 1%= -4.141  5%= -3.497  10%= -3.178 | Not Stationary |
| **Exchange rate** | Intercept | -4.808 | 1%= -3.563  5%= -2.919  10%= -2.597 | -6.480 | 1%= -3.560  5%= -2.918  10%= -2.597 | Stationary |
| Intercept and Trend | -5.016 | 1%= -4.145  5%= -3.499  10%= -3.179 | -6.665 | 1%= -4.141  5%= -3.497  10%= -3.178 | Stationary |
| **Oil Prices** | Intercept | -5.244 | 1%= -3.563  5%= -2.919  10%= -2.597 | -6.498 | 1%= -3.560  5%= -2.918  10%= -2.597 | Stationary |
| Intercept and Trend | -5.191 | 1%= -4.145  5%= -3.499  10%= -3.179 | -6.432 | 1%= -4.141  5%= -3.497  10%= -3.178 | Stationary |
| Unit Root Tests Second Difference | **Government Expenditure on Education** | Intercept | -8.782 | 1%= -3.568  5%= -2.921  10%= -2.599 | -3.191 | 1%= -3.563  5%= -2.919  10%= -2.597 | Stationary |
| Intercept and Trend | -11.550 | 1%= -4.153  5%= -3.502  10%= -3.181 | -3.220 | 1%= -4.145  5%= -3.499  10%= -3.179 | Stationary |

**SOURCE:** *Computed From Research Data*

**TABLE 3:** *Correlation Matrix*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | **d(Aggregate Exp. on Oil Imports)** | **d(Government Exp. on Health)** | **d2(Government Exp. on Education)** | **d(Exchange Rate)** | **d(Oil Price)** |
| **d(Aggregate Expenditure on Oil Imports)** | **Coefficient** | **1.000** |  |  |  |  |
| t-statistics | ----- |  |  |  |  |
| Probability | ----- |  |  |  |  |
| **d( Government Expenditure on Health)** | **Coefficient** | **0.326\*** | **1.000** |  |  |  |
| t-statistics | 2.460 | ----- |  |  |  |
| Probability | 0.017 | ----- |  |  |  |
| **d2(Government Expenditure on Education)** | **Coefficient** | **0.440\*** | **0.184** | **1.000** |  |  |
| t-statistics | 3.496 | 1.333 | ----- |  |  |
| Probability | 0.001 | 0.188 | ----- |  |  |
| **d(Exchange Rate)** | **Coefficient** | **0.001** | **-0.034** | **-0.095** | **1.000** |  |
| t-statistics | 0.004 | -0.241 | -0.684 | ----- |  |
| Probability | 0.997 | 0.811 | 0.497 | ----- |  |
| **d(Oil Price)** | **Coefficient** | **0.243** | **0.063** | **0.098** | **-0.156** | **1.000** |
| t-statistics | 1.789 | 0.449 | 0.704 | -1.131 | ----- |
| Probability | 0.080 | 0.655 | 0.485 | 0.264 | ----- |

**SOURCE:** *Computed From Research Data*

**TABLE 4:** *Granger Causality Test Results between Aggregate Expenditure on oil imports and Government Expenditure on Health*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **Chi-square** | **P- Values** |
| Aggregate expenditure on oil imports does not Granger cause Government expenditure on health | 23.768\* | 0.000 |
| Government expenditure on health does not Granger cause Aggregate expenditure on oil imports | 20.560\* | 0.000 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**TABLE 5:** *Granger Causality Test Results between Aggregate Expenditure on Oil imports and Exchange rate*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **Chi-square** | **P- Values** |
| Aggregate expenditure on oil imports does not Granger cause Exchange rate | 10.947\* | 0.012 |
| Exchange rate does not Granger cause Aggregate expenditure on oil imports | 2.287 | 0.515 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**TABLE 6:** *Granger Causality Test Results between Government Expenditure on Health and Exchange rate*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **Chi-square** | **P- Values** |
| Government expenditure on health does not Granger cause Exchange rate | 10.212\* | 0.017 |
| Exchange rate does not Granger cause Government expenditure on health | 4.330 | 0.228 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**TABLE 7:** *Granger Causality Test Results between Oil prices and Aggregate Expenditure on Oil Imports*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **Chi-square** | **P- Values** |
| Oil price does not Granger cause Aggregate expenditure on oil imports | 2.977 | 0.395 |
| Aggregate expenditure on oil imports does not Granger cause Oil price | 2.333 | 0.506 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**TABLE 8:** *Granger Causality Test Results between Oil prices and Government Expenditure on Health*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **Chi-square** | **P- Values** |
| Government expenditure on health does not Granger cause Oil price | 12.433\* | 0.006 |
| Oil price does not Granger cause Government expenditure on health | 6.315 | 0.097 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**TABLE** 9**:** *Johansen Test Co-integration results*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Hypothesized No. of CE(s)** | **Eigen Value** | **Trace Statistic** | **Critical value (0.05)** | **Prob.\*\*** | **Max-Eigen Statistic** | **Critical value (0.05)** | **Prob.\*\*** |
| None | 0.787 | 115.153\* | 47.856 | 0.000 | 80.503\* | 27.584 | 0.000 |
| At most 1 | 0.407 | 34.650\* | 29.797 | 0.013 | 27.208\* | 21.131 | 0.006 |
| At most 2 | 0.119 | 7.443 | 15.495 | 0.527 | 6.607 | 14.265 | 0.537 |
| At most 3 | 0.016 | 0.835 | 3.841 | 0.361 | 0.835 | 3.841 | 0.361 |
| ***\*denotes rejection of hypothesis at the 0.05 significant level.***  ***Max-Eigen and Trace tests indicate that 2 equations are co-integrated at the 0.05 significant level*** | | | | | | | |

**SOURCE:** *Computed From Research Data*

**TABLE 10:** *Error Correction Model Estimates*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** |  | **D(Government expenditure on health)** | **D(Expenditure on oil imports)** | **D(Exchange rate)** | **D(Oil prices)** |
| **Cointegrating Equation (Error CorrectionTerm)** | Coefficient | -2.624\* | 2.401 | 0.002\* | 0.001 |
| t-statistic | [-3.403] | [0.770] | [2.836] | [0.301] |
| p-values | 0.002 | 0.446 | 0.007 | 0.765 |
| **D(Government expenditure on health) (-1)** | Coefficient | 1.995\* | 0.108 | -0.002\* | 0.000 |
| t-statistic | [3.382] | [0.045] | [-2.742] | [0.141] |
| p-values | 0.002 | 0.964 | 0.009 | 0.888 |
| **D(Government expenditure on health) (-2)** | Coefficient | 2.054\* | 3.039 | -0.001\* | 0.001\* |
| t-statistic | [3.911] | [1.432] | [-3.128] | [1.196] |
| p-values | 0.000 | 0.161 | 0.003 | 0.239 |
| **D(Government expenditure on health) (-3)** | Coefficient | 0.456 | 1.324 | -0.001\* | 0.001 |
| t-statistic | [1.215] | [0.873] | [-2.822] | [0.704] |
| p-values | 0.232 | 0.388 | 0.008 | 0.486 |
| **D(Aggregate expenditure on oil imports) (-1)** | Coefficient | -0.122 | -0.029 | 0.000\* | -0.000 |
| t-statistic | [-1.219] | [-0.072] | [3.115] | [-0.546] |
| p-values | 0.231 | 0.943 | 0.004 | 0.588 |
| **D(Aggregate expenditure on oil imports) (-2)** | Coefficient | -0.259\* | -0.449\* | 0.000\* | -0.000 |
| t-statistic | [-4.761] | [-2.039] | [-1.219] | [-1.219] |
| p-values | 0.000 | 0.049 | 0.037 | 0.231 |
| **D(Aggregate expenditure on oil imports) (-3)** | Coefficient | -0.017 | 0.006 | 0.000 | -0.000 |
| t-statistic | [-0.260] | [0.022] | [1.183] | [-1.158] |
| p-values | 0.796 | 0.983 | 0.245 | 0.254 |
| **D(Exchange rate) (-1)** | Coefficient | -27.844 | 267.914 | 0.212 | 0.058 |
| t-statistic | [-0.172] | [0.420] | [1.279] | [0.161] |
| p-values | 0.864 | 0.685 | 0.209 | 0.873 |
| **D(Exchange rate) (-2)** | Coefficient | -159.213 | -16.966 | 0.025 | -0.088 |
| t-statistic | [-1.006] | [-0.027] | [0.154] | [-0.251] |
| p-values | 0.321 | 0.979 | 0.879 | 0.804 |
| **D(Exchange rate) (-3)** | Coefficient | -270.106 | -849.701 | 0.247 | -0.094 |
| t-statistic | [-1.758] | [1.368] | [1.563] | [-0.274] |
| p-values | 0.087 | 0.180 | 0.127 | 0.786 |
| **D(Oil Prices) (-1)** | Coefficient | -272.868\* | -215.068 | -0.151 | 0.070 |
| t-statistic | [-2.332] | [-0.455] | [-1.255] | [0.269] |
| p-values | 0.025 | 0.652 | 0.217 | 0.790 |
| **D(Oil Prices) (-2)** | Coefficient | -83.615 | -383.693 | -0.050 | -0.089 |
| t-statistic | [-0.641] | [-0.728] | [-0.373] | [-0.305] |
| p-values | 0.525 | 0.471 | 0.711 | 0.762 |
| **D(Oil Prices) (-3)** | Coefficient | -22.889 | 759.724 | 0.204 | 0.196 |
| t-statistic | [-0.188] | [1.540] | [1.632] | [0.723] |
| p-values | 0.852 | 0.132 | 0.111 | 0.474 |
| **Constant** | Coefficient | 71.479 | 3793.495 | 2.579\* | 1.403 |
| t-statistic | [0.081] | [1.059] | [2.835] | [0.711] |
| p-values | 0.936 | 0.297 | 0.007 | 0.481 |

**SOURCE:** *Computed From Research Data*

**TABLE 11:** *Granger Causality Test Results between Government Expenditure on Education and Aggregate Expenditure on Oil Imports*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **F-statistic** | **P- Values** |
| Aggregate expenditure on oil imports does not Granger cause Government expenditure on education | 0.395 | 0.676 |
| Government expenditure on education does not Granger cause Aggregate expenditure on oil imports | 6.820\* | 0.003 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**TABLE 12:** *Granger Causality Test Results between Exchange rate and Government Expenditure on Education*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **F-statistic** | **P- Values** |
| Government expenditure on education does not Granger cause Exchange rate | 0.356 | 0.702 |
| Exchange rate does not Government expenditure on education | 0.840 | 0.438 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**TABLE 13:** *Granger Causality Test Results between Oil prices and Government Expenditure on Education*

|  |  |  |
| --- | --- | --- |
| **Null Hypothesis** | **F-statistic** | **P- Values** |
| Oil price does not Granger cause Government expenditure on education | 0.670 | 0.517 |
| Government expenditure on education does not Granger cause Oil price | 3.593\* | 0.036 |
| **Note:**\*denotes rejection of the null hypothesis at 0.05 significant level. | | |

**SOURCE:** *Computed From Research Data*

**FIGURE 1.2:** *Trends in Annual Expenditure on Oil Imports and Government Expenditures on Health and Education.*

**SOURCE OF DATA: *Annual Economic Surveys and Statistical Abstracts***